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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/915,076	07/25/2001	Gerald J. D'Amato	10010311-1	6474

7590 12/13/2002

AGILENT TECHNOLOGIES
Legal Department, 51U-PD
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EXAMINER

THAI, LUAN C

ART UNIT PAPER NUMBER

2827

DATE MAILED: 12/13/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/915,076

Applicant(s)

D'AMATO ET AL.

Examiner

Luan Thai

Art Unit

2827

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) 19-25 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13-18, 26 and 27 is/are rejected.
- 7) ☒ Claim(s) 12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election of Group I, claims 1-18, 26 and 27 in Paper No. 3 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Oath/Declaration

2. The declaration filed 07/25/01 is acceptable.

Drawings

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, three alignment pads claimed in claims 2, 11, 12, 16, and three alignment bullets claimed in claim 18, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claim 17 is objected to because of the following informalities: in claim 17, the recitation of "said number of alignment **members**" should be changed to--said number of alignment **bullets**-- and the limitation of "**said** wetting media" should be changed to--a wetting media--. Appropriate correction is required.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

6. Claims 13, 15-18, and 27, are rejected under 35 U.S.C. 102(e) as being anticipated by Coico et al. (6,354,844).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 13, 15, 17, and 27, Coico et al. disclose (see specifically figures 1 and 3) an integrated circuit package 1 comprising: a land grid array of contact pads 17 and a number of alignment pads 17 applied to a surface of the integrated circuit package; a number of alignment bullets 53-55 (Col. 5, lines 3+ and lines 27+) attached to the alignment pads 17 at known locations with respect to the pattern of contact pads, wherein the alignment bullets 53-55 are attached to the alignment pads 17 via wetting media (Col. 5, lines 17+).

Regarding claims 16 and 18, Coico et al. further disclose that the number of alignment bullets and pads may vary so long as there are at least two (Col. 5, lines 50+).

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-4, 7-11 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coico et al. (6,354,844) in view of Rostoker et al. (5,558,271).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 1-4, 8-10 and 26, Coico et al. disclose (see specifically figures 1 and 3) an integrated circuit package 1 comprising: a land grid array of contact pads 17; a number of alignment pads 17', which may vary so long as there are at least two (Col. 5, lines 50+), applied to a surface of the integrated circuit package; a number of alignment balls or bullets 53-55 (Col. 5, lines 3+ and lines 27+) attached to the alignment pads 17 via wetting media (Col. 5, lines 17+) at known locations with respect to the land grid array of contact pads 17. Coico et al. fail to teach the *annular ring shape* of the alignment pads.

Rostoker et al. while related to a similar apparatus for aligning a ball/bump on a bond pad teach (see specifically figures 3a-3b, 4a-4b, and 6a-6b) the pad

410/310, which has a diameter smaller than that of the mating conductive ball 640 (e.g., alignment member), is formed with a centrally located opening 415/315 for the purpose of mechanically registering a mating conductive ball/bump contact (Col. 8, lines 37+) via the solder paste (e.g., wetting media) 420/320 (Col. 8, lines 5+, Co. 7, lines 26+) and improving the joining technique for formation of joints in solder ball joining processes (Col. 4, lines 1+ and lines 12+).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the device structure of Coico et al. by applying the annular ring shaped bond pad of Rostoker et al. in order to improve the joining technique for formation of joints in solder ball joining processes.

Regarding claims 7 and 11, although Coico et al. and Rostoker et al. do not explicitly disclose that the alignment members/ball appears is hard enough to resist deformation as the package is aligned with an interface, this feature is taken to be inherent in the proposed device of Coico et al. and Rostoker et al. Since Coico et al. disclose that the alignment member/alignment ball 53-55 may be fixed to the pad site by an adhesive (Col. 5, lines 18+), and Rostoker et al. show in figures 6a-6b that the conductive ball 640 is kept the curve surface shape as being attached to the pad via wetting media (solder paste 620), it is apparent that the alignment members/ball is hard enough to resist deformation as the package is aligned with an interface.

9. Claims 1-3, 5-6 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Coico et al. (6,354,844) in view of Sawaya (5,191,511).

The figures and reference numbers referred to in this office action are used merely to indicate an example of a specific teaching and are not to be taken as limiting.

Regarding claims 1-3, 5-6 and 26, Coico et al. disclose (see specifically figures 1 and 3) an integrated circuit package 1 comprising: a land grid array of contact pads 17; a number of alignment pads 17', which may vary so long as there are at least two (Col. 5, lines 50+), applied to a surface of the integrated circuit package; a number of alignment bullets 53-55 (Col. 5, lines 3+ and lines 27+) attached to the alignment pads 17' at known locations with respect to the land grid array of contact pads 17. Coico et al. fail to teach the *annular ring shape* of the alignment pads and the alignment bullet having a raised disc to protrude into the ring shaped pad.

Sawaya while related to a similar semiconductor package design teaches (see specifically figures 2-3) the pad 9, which is applied to a surface of the integrated circuit package 1, is in annular ring shaped (Col. 3, lines 47+), and the bullet (bump) 8 having an end comprising a raised disc to protrude into the ring shaped pad 9. The purpose of doing so would improve the bonding contact of the bullet (bump) 8 to the ring pad 9 and to the integrated circuit package 1.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Coico et al.'s device by applying the annular ring shaped bond pad of Sawaya in order to improve the bonding contact of the

alignment bullet (bump) to the ring alignment pad and to the integrated circuit package, and such modification is held to be within the ordinary designing ability expected of a person skilled in the art.

Allowable Subject Matter

10. Claim 12 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter: the prior art taken either singly or in combination fails to anticipate or fairly suggest a detail and structural interrelationship between the alignment bullet, which has a height being greater than its diameter and an end with a raise disc, and the annular ring alignment pad having a wetting media deposited to, wherein the raise disc of the alignment bullet is shaped to protrude into one of the annular ring shaped alignment pads, as recited in claim 12, especially when these limitations are considered within the specific combination claimed.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luan Thai whose telephone number is (703) 308-1211. The examiner can normally be reached on 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L. Talbott can be reached on (703) 305-9883. The fax phone numbers for the organization where this application or proceeding is assigned are (703)

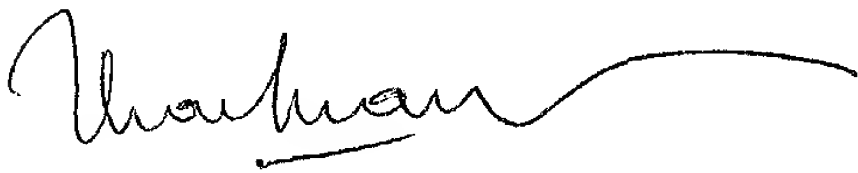
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308-7722 for regular communications and (703) 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

A handwritten signature in black ink, appearing to read 'Luan Thai', with a long horizontal flourish extending to the right.

Luan Thai
December 3, 2002